

ARCHITECTURAL PROGRAM

Convergence Sciences 2 Facility for Digital Transformation

March 2020

FY 2020 Capital Project Request

Wichita State University

Office of Facilities Planning



ARCHITECTURAL PROGRAM

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INTRODUCTION

The Kansas Board of Regents strategically supports public higher education institutions as they contribute to the social and economic well-being of Kansas and its citizens through preparing students for life and the workforce, research contributions, and intentional partnership in growing the Kansas economy.

The Board's new strategic plan builds on the *Foresight 2020* foundations identifying high impact practices and opportunities which are system- and sector-led initiatives designed to help drive improvement at the institutional level. The new plan includes three pillars – Family, Business and Prosperity. The newly added Prosperity Pillar prioritizes innovative programming that intentionally advances technologies that build state and local economic prosperity.

To grow, or even maintain, economic prosperity, Kansas must improve innovative capacity via increased research and development (R&D) spending, greater investment in local R&D institutions, enhanced workforce training, and additional institutions for collaboration.

In furtherance of its vision and mission to be an essential educational, cultural and economic driver for the State of Kansas, Wichita State University requests that the Board of Regents review and approve the FY2020 Capital Project Request for the University's National Institute of Digital Transformation (NIDT) and Convergence Sciences. The NIDT will explicitly support Pillar 3 of the Strategic Plan established by the Kansas Board of Regents. The NIDT is a cornerstone of President Golden's Initiative for Convergence Sciences which entails integrating knowledge, methods, and expertise from different disciplines and forming novel frameworks to **catalyze scientific discovery and innovation**. The result being novel research and subsequent innovations that can be exported worldwide which, will help diversify and advance the economy of Kansas.

Recent aviation industry layoffs reinforced the critical need to diversify the Kansas economy and focus on the jobs of the future. Those jobs are in technology. For the last 40 years, all net new jobs in the U.S. economy have been technology jobs, mainly from companies less than five years old. The University's planned National Institute of Digital Transformation and Convergence Sciences will focus on (1) research and innovation in cloud computing and software development utilizing high speed broadband in Kansas; (2) research and service laboratories in cybersecurity and cyber operations; and (3) research and service laboratories to provide the needed system engineering technology for Kansas to compete globally. Convergence sciences enables multiple academic departments, faculty, staff, and students from different disciplines in partnership with industry the opportunity to conduct innovative and collaborative research in fields that are vital to the economic growth and national security of our state, region and country.

The National Institute of Digital Transformation would be based on the model and strengths of NIAR but focused on developing technology that can transform other

industries, including aviation, to drive economic development and support new ventures in Kansas. In fact, several companies, including a publicly-traded Fortune 500 company and a multinational professional services network supporting technology and automated manufacturing, have become the first to take root on the Innovation Campus and will likely continue to grow and attract other businesses in this industry with this infrastructure and research support at Wichita State University.

Digital transformation and convergence science research will provide Wichita State students with an opportunity to conduct research in various disciplines supporting multiple industry sectors. The knowledge and competencies acquired by students will be vital to Kansas industry as the student's transition to employment.

Industry from Kansas as well as national and global industrial partners that will have a new presence in Wichita, in collaboration with University teams, will conduct development and certification programs in the facility enabling increased speed to market for launch of new globally competitive products, processes and businesses. This industry participation will provide income required for operation and maintenance.

Wichita State University is requesting to build a new facility for Convergence Sciences and Digital Transformation to drive diversification and revitalization of the regional economy and create jobs. The facility would be a three-story building with a building footprint of approximately 26,500 Sq. Ft. The subtotal square footage for the programmed spaces would be approximately 49,000 Sq. Ft. Future shelled space would also be included on the third floor of this building to accommodate any changes in research or functions that University would need to address. The total square footage for both the programmed and shelled space is approximately 56,000 SF. The floor to floor height for the First Floor to Second Floor will be approximately 18'-0". The floor to floor height of the Second Floor to the Third Floor will be 16'-0". The Third Floor to roof framing height will be 16'-0". This building would be focused around the convergence of many departments for the sole purpose of developing research in the economic sectors that affect and or will emerge in this region.

The building would house multiple client specific areas composed of a conference room / work area and will provide clients both in the private and public sector the ability to perform full scale testing. Another goal of this facility would be to provide more research and development work into testing methodologies, procedures, and processes with new technology to provide more efficient test protocols to clients. This new facility will enable the region and Kansas to expand its testing capabilities to support clients within the interconnected economic sectors.

Digital transformation can vastly expand the potential of the economy and generate opportunities for many. Digital technology improvements are the most important driving factor for business sustainability as they are redefining work and transforming the structure of the entire economy. It is essential that Wichita State urgently expand the high-skill information technology talent pipeline and create capacity to upskill incumbent workers as knowing digital skills represent a key channel to productivity gains. The

National Institute will provide additional direct jobs for faculty and staff but will also provide applied learning opportunities for students. The following table provides the estimated direct total full-time equivalent (FTE) jobs immersed in digital transformation at the National Institute. Each student job is equal to 0.5 FTE and it is anticipated that the student to staff ratio will be a minimum of four students to each staff thereby expanding the high-skilled information technology pipeline.

The Institute anticipates an equipment investment of \$20 million half donated by the private sector and half funded by the public sector. Over the 10-year term of the analysis, it is estimated that there will be 1,300 applied learning experiences.

Table 1. Growth Metrics for First 10 Operating Years

	Total Direct Jobs		3. Equipment Investment	4. R&D Grant and Contracts
	1. Added/Created	2. Retained		
10 Year Outcomes	95 FTE Faculty, Staff and Students per year	33 FTE	\$20 Million	\$40 Million

To maintain economic prosperity Kansas must increase research and development (R&D) spending and provide greater investment in local R&D institutions. In the first ten years of operation, it is estimated that the NIDT will engage in \$40 million dollars of grant and contract research with over \$16 million of research programming in the tenth year. The National Institute will improve Kansas's digital workforce skills in and increase labor productivity and the potential of individuals and society. It will also be a catalyst for attracting global companies to our state as research and innovation partners and provide the creation of small businesses as part of Wichita State University's MicroEnterprise Initiative.

If the state of Kansas invests in developing digital transformation tools and skills in our workforce, we will provide opportunity and drivers to sustain both large and small business growth and development. Technology has given small businesses the power to operate like big businesses. Across all industries, technological tools can help large and small businesses get better organized, efficiently manage their finances, or support customer service and win new business.

If the state of Kansas cannot invest in developing centers of excellence to train and support a workforce skilled in applying digital transformation tools to grow and create new business, those businesses will have no choice but to move and center their operations around locations that do invest in a digitally skilled and savvy workforce.

PROJECT SCOPE

This facility is planned to be sited at the Southwest corner of Oliver St. and the 18th street entrance to the Wichita State University Innovation Campus. The design and construction of the facility will produce a permanent multi-story structure. The potential to building out the remaining portion of one of the multi- stories should be factored into the design. Overhead doors will be required at the “Client” areas as well as Product Development Area. A concrete surface drive will be needed to access the overhead doors in these areas.

Testing Lab:

This testing conducted in the lab area will be based on UL, CE, and ISO standardization for Test Equipment Calibration. This lab will include three different testing parts that include the following: Part 1 Environmental, Part 2 EMI 17025, and Part 3 NEBS.

Part 1 Environmental shall include a Walk-In Thermal Chamber, Shock Vibration testing, Power Testing, and Acoustic Testing. Testing in Part 1 can be conducted over the space of seven to ten days. Students can be certified in the testing protocols for the different pieces of equipment.

Part 2 NEBS shall include equipment for an Earthquake test, Burn test, Shock/Vibrate test, Drop Test, Incline Test, Shaker Test, and Tip Test. The Drop Test shall include a two-ton crane and a twelve-foot vertical space to conduct the test.

This testing area shall be adjacent to Project Rooms where occupants can use the space to set up their proprietary information for their tests. These rooms can be setup with IOT spaces with sensor areas. Materials for these project rooms can be shipped to the facility and stored in pens until the client is ready to test. Once the materials are tested these materials are then sent back to the client for proper disposal.

A Showroom shall be near the Testing Lab so that prospective clients can gather information on the types of testing functions being conducted within the space. This Showroom shall have both static and fluid displays to communicate the functionality of the space.

Cyber Range:

The Cyber Range shall be an enclosed space that allows for the collaboration and testing of cyber security components for private industry to Department of Defense clients. This space shall include for the deployment of Red, Blue and White Cells to conduct research and cyber simulations within a secure environment such as in a SCIF. SIPRNet standards shall be maintained for a portion of the space. This space shall be flexible and be able to accommodate three to ten people per cell. Multiple monitors and computers shall populate the space for use by the occupants. Adjacent space to the Cell space shall be a multi-use classroom and administration support. Two offices shall

be provided for the Director of the Range and a hoteling office for drop-in guests.

Deep Fake Lab:

The Deep Fake Lab shall be a space that functions like a compositing lab. This shall include space for at a minimum six workstations, with dual monitors (regular monitor and a wake-up monitor). It shall also include an editing station and mixing board in each workstation. This lab shall be able to be reconfigured to two labs if the Department of Defense is involved in utilizing this space.

Product Development:

Product Development shall be a space that is the “front door” for Innovation at the Convergence Science 2 Building. This area shall be a raw, open broad-based space that can be reconfigured in a multitude of options that include small collaboration style, classroom style, and full project workspace. At any one time there could be five to eight projects being worked on within this space. Storage of raw materials shall be included in a portion of this space. Other areas for storage of raw materials shall be in the main storage space. This space shall also include small tools along flexible benches. Welding will not be conducted in this area and fume hoods shall not be included in this area.

Convergence Administration Area:

This area shall include space for 20 FTEs. They shall be placed in 6 enclosed offices and 14 workstations / collaboration stations. This area shall also include a Work Room, Break Area, Large Conference Room, and a Receiving / Reception space.

T3 Software Development:

This area shall include space for 5 FTEs which includes 1 Program Manager and 4 developers within a shared office. Within this area shall be a large team room and a shared open space.

SOC Area:

This area shall include space for 1 FTE office, 1 Network Office, and multifunction open space that shall be flexible. This area shall utilize a myriad of flat panels along the walls and it shall have the function of being on and off the core network.

Visual & Simulation Studio:

This area shall include a dedicated room with a 320-degree video panel wall that allows for users to display any type of media for simulations in both 2D and 3D reality techniques. This technology will allow users to interact with complex data in ways that

accelerate and deepen their learning. The location of the studio should be near the main entrance to the building to allow easy access to visitors to the facility.

Other:

All these functions shall utilize shared Project Rooms, Training Rooms, Client Rooms, a Shipping Receiving Area, Dock, Storage and Collaboration Spaces throughout.

DESIGN CODES & STANDARDS

The building is to be design to the State of Kansas adopted building codes listed below:

- a. 2018 International Building Code
- b. 2018 International Fire Code
- c. 2018 International Mechanical Code
- d. 2018 International Plumbing Code
- e. 2018 International Fuel Gas Code
- f. 2017 NFPA 70 – National Electrical Code
- g. 2018 International Energy Conservation Code
- h. National Fire Protection Association National Fire Codes and Standards

SUSTAINABLE DESIGN

LEED Certification:

The building is to be designed to meet or exceed the requirements of LEED Version 4, Silver Rating.

Commissioning:

The building and mechanical systems will be commissioned in accordance to the 2018 International Energy Code and LEED Version 4, Fundamental Commissioning Requirements.

DESIGN REQUIREMENTS

The structure will be complete, with the appropriate exterior and interior finishes, lighting, power and mechanical systems, parking and egress for individuals with disabilities, drainage systems, interior and exterior signage, and landscaping to provide a complete, functional, relatively maintenance-free and aesthetically pleasing facility. Sustainable design shall be an integrated layer of the design and construction of this new building. The exterior finishes shall be consistent with the quality, appearance and standard of the newly constructed buildings such as NIAR AVET, and the John Bardo Center. The PB4 NetApp Building will be under construction however it shall meet the same innovative design aesthetic of this area of the Innovation Campus. It is anticipated that between 50 to 75 parking spaces will be needed for this facility. The total parking count for this facility will be evaluated by Wichita State once the site plan layout is finalized.

The A/E consultant shall review the specific requirements for the equipment components associated with the Testing Area and the respective testing criteria. These specific requirements will include electrical, mechanical and structural engineering design. Temperature and humidity controls will be required for this Testing Area for proper testing of the hardware and components.

Due to the nature of potential federal and proprietary testing being conducted in this facility, security is a top priority. Access controls on all exterior doors utilizing card readers shall be tied back to the building control and security systems. All interior spaces and department suites shall have card reader controls as well.

The exterior of the facility shall be protected with a grounded lighting protection system. This lighting protection system shall have components meet the following standards that include the NFPA 780, UL Standard 96 & 96A, and LPI 175. These standards not only address the components but also define the basis principle of creating a low resistance path for lightning to follow that would prevent destruction, fire, damage, death and injury as the current flows from the roof levels to below grade.

The A/E consultant shall utilize specialized expertise of the architecture engineering/consulting firm's layout, design, structural design, as well as the knowledge and experience in the selection of the most cost-effective details such as materials, and construction methods. The facility shall be designed and constructed to be as maintenance free as possible within the funds available.

It should be emphasized that the accuracy of construction estimates is critical to the successful completion of this project. The University expects that the project bid documents must have assurance of the ability to award a construction contract to provide the minimum requirements listed in the project description above. The documents shall further be structured to include bid alternates that will permit award of a construction contract.

MEP Data

Climate:

- a. Climate Data used for the design shall be the 2013 ASHRAE Fundamentals Table data for Col. James Jabara Airport.

Heating DB (99.6%):	7.1 degrees
Cooling DB (0.4%):	99.4 degrees
Cooling MCWB (0.4%):	74.0 degrees

System Redundancy:

- a. The HVAC systems serving the data center will require one additional unit to allow for system redundancy.

Space Zoning:

- a. HVAC systems shall be zoned according to building exposure, similar function, and occupancy schedules.

Occupancy:

- a. Normal occupancy and operations for the facility are as follows:

Offices	7am - 7pm
Data Center:	24-hour operation
Testing lab:	24-hour operation

Building Plumbing and Piping Systems:

- a. **Domestic Water:**

2" tap and meter, 3" copper domestic waterservice from water main to building - Type L copper water distribution piping within building – reduced pressure zone backflow preventer at building service entrance - isolation ball valves at branches to fixture groups and equipment. Domestic hot and cold water are to be insulated in accordance with the 2018 IECC / ASHRAE 90.1-2010.

- b. **Sanitary Waste and vent:**

Schedule 40 solid core waste and vent piping - 6" PVC sanitary sewer from building to city sewer main – cleanouts at ends of mains, major connections, and as required by code. Piping above grade and in return air plenums to be no-hub cast-iron or schedule 40 solid core waste and vent piping wrapped with 1-hour rated fire wrap insulation.

c. Roof Drainage:

6" diameter roof drains piped underground to tie into nearest storm sewer.
6" diameter overflow drains piped to discharge on grade through wall mounted downspout nozzles. Piping to be no-hub cast-iron or schedule 40 solid core PVC. Piping located in return air plenums to be no-hub cast-iron or schedule 40 PVC wrapped with 1-hour rated fire wrap insulation. Roof drain piping to be insulated in accordance with the 2018 IECC / ASHRAE 90.1-2010.

d. Condensate drains:

Schedule 40 PVC. Drains located in return air plenums to be copper with sanitary fittings or schedule 40 PVC wrapped with 1-hour rated fire wrap insulation.

e. Natural Gas:

Schedule 40 Black Steel from meter to mechanical equipment. Service and meter to be provided and sized by utility company.

f. Water Heaters:

150 MBH input, high-efficiency, direct vent type. One water heater to serve building general service. Temperature controlled circulating pumps for the system. Master mixing valves to be provided to set leaving water temperatures.

g. Floor Drains:

4" round

h. Floor Sinks:

8"x8" cast-iron with porcelain enamel interior coating.

i. Water closets:

Wall-mounted vitreous china water closets – carriers – Electric powered flush valves or equivalent.

j. Urinals:

Wall-mounted vitreous china urinals – carriers – Electric powered flush valves or equivalent.

k. Lavatories:

Counter-mounted vitreous china lavatories - chrome plated electric powered sensor operated faucets. Provide lead-free mixing valve.

l. Break Room Sinks:

Counter-mounted single compartment stainless steel sinks. Chrome plated single-lever faucet with swing spout.

m. Electric Water Coolers:

Dual height electric water coolers with bottle filler.

n. Mop Basin:

Molded stone with chrome plated faucet.

o. Exterior Wall Hydrants:

Freeze-proof exterior wall hydrants.

p. Elevator Sumps Pumps:

Elevator Sump basins and pumps: 24" inch diameter x 36" deep basin with sump pump capable of 50 gpm at 15 ft. head.

Fire Protection:

a. General:

Fire protection systems are to be provided under a design-build contract. Systems are to be designed and sealed by a Fire protection Engineer licensed in the State of Kansas.

b. Fire Water Service:

A new Fire Sprinkler main and system will be extended from the city main to a fire sprinkler riser.

c. Sprinklers:

Fire sprinklers will be installed in all office and general spaces to meet fire code requirements.

d. Fire Sprinkler Piping:

Fire sprinkler system piping will be schedule 40 steel for mains and schedule 10 steel for individual branches.

e. Fire Sprinkler System – Office Areas:

All areas of the building except for the data center, main electrical service room, and testing lab are to have a wet-pipe fire sprinkler system installed in accordance with NFPA 13.

f. Fire Sprinkler System – Data center, testing lab, and main electrical service room:

The data center, main electrical service room, and testing lab areas shall have

independent fire protection systems suitable for data center systems. Systems shall be Double Interlock Pre- action water suppression type.

HVAC Systems and Equipment:

The systems described meet and improve on LEED prerequisites to qualify for points for buildings three stories or less and under 75,000 square feet. However, alternative systems such as hydronic VAV reheat or using chillers with air handling units in lieu of RTUs may require consideration to gain increased efficiency for additional LEED points. VRF systems are not to be considered. The total number of LEED points needed from the HVAC system design will be determined by the building-wide approach to attaining LEED Silver.

a. Admin and Convergence Suites:

The spaces will be conditioned by (4) 50-ton roof mounted high efficiency packaged roof tops units. The rooftop units shall have R-410A DX cooling – modulating compressors - modulating natural gas heat – variable frequency fan drives – 100% integrated enthalpy economizers – energy recovery wheels - power exhaust – MERV-13 filters – 460v/3ph/60hz electrical service, insulated curb with vibration isolation, smoke detectors with fan shut-down. Medium pressure supply air from the VAV rooftop unit to be ducted through sheet metal ductwork down in vertical chases and then horizontally to VAV terminal units in each area. The occupied spaces will be served by approximately (70) 1500 cfm single-duct Variable Air Volume terminal units. VAV terminals shall have 2 to 5 KW 460v/3ph./60Hz. electric heating coils. Corridors, Lobbies and public areas to be served by (10) 1500 cfm series fan-powered boxes providing constant airflow to those spaces. Return to the rooftop units shall be by use of a return air plenum above the ceiling. Sheet metal ductwork with a minimum of 3 elbows shall be extend from each rooftop unit return connection.

b. Data Center Rack Area (Approx. 4,000 s.f.):

The rack area will be conditioned (5) 130-ton, 50,000 cfm roof mounted high efficiency packaged roof tops with VAV control. Units will have DX cooling, multiple staged compressors, hot-gas reheat with dehumidification controls – variable frequency supply fan motor drive, R-410A refrigerant, 2" MERV 13 filters, insulated vibration isolation roof curbs, and an unpowered convenience outlet. (1) 130-ton rooftop unit with similar features will be installed for 100% system redundancy. A common supply header will connect the supplies on all the rooftop units. Air will be ducted from the common header to supply conditioned air to a sheet metal supply plenum above each enclosed center rack cold isle. (4) 24"x24' steel eggcrate grilles will be installed in each cold isle plenum. A motorized discharge air damper in the main unit supply and the unit VFD shall maintain a pressure of 1.0" w.g. in the cold isle supply plenums. Return will be directly from the space to the rooftop units with no additional

ductwork.

c. Electrical / Utility (Approx. 3,600 s.f):

The Electrical and Utility spaces will be served by (2) 20-ton roof mounted high efficiency, constant volume packaged roof tops units. The rooftop unit shall have R-410A DX cooling – multiple or modulating compressors, modulating natural gas heat – standard fan drives – 100% integrated enthalpy economizers - power exhaust – MERV-13 filters – 460v/3ph/60hz electrical service, insulated curbs with vibration isolation, smoke detectors with fan shut-down. Return will be ducted to the rooftop units.

d. Maintenance / Shipping / Service Corridors:

Shipping/Receiving area and service corridors will be served by roof mounted high efficiency, constant-volume packaged roof tops unit. The rooftop unit shall have R-410A DX cooling – natural gas heat – standard fan drives – 100% integrated enthalpy economizers - power exhaust – MERV-13 filters – 460v/3ph/60hz electrical service, insulated curb with vibration isolation, smoke detectors with fan shut-down. Return will be ducted to the rooftop units.

e. Elevator Equipment rooms:

Elevator equipment rooms shall be conditioned by 2-ton ductless split systems with DX cooling and roof mounted condensing units.

Ductwork:

a. General

All ductwork is to be constructed, installed, and sealed in accordance with SMACNA standards. All branch ductwork and runouts to individual diffusers shall have manual volume dampers installed to allow for balancing.

b. Medium pressure supply ducts (>2" static pressure):

Round spiral ductwork or rectangular sheet metal ductwork mains with minimum 2" duct wrap insulation.

c. Low pressure supply ducts (<2" static pressure):

Rectangular sheet metal ductwork mains with 2" duct wrap insulation – round runouts to be ducted with spiral ductwork and 2" duct wrap insulation – high-efficiency duct take-offs to diffusers and grilles.

d. Return ductwork:

Rectangular sheet metal ductwork with 2" duct wrap insulation.

e. Exhaust ductwork:

Galvanized sheet metal ductwork.

Grilles, Registers, and Diffusers:

- a. **Supply Diffusers – Lay-in Ceilings**
Louvered 2'x2' lay-in type diffusers
- b. **Supply Diffusers – Hard Ceilings**
Louvered type diffusers
- c. **Supply Diffusers – 2 Story Lobby**
Linear type diffusers
- d. **Return Grilles – Lay-in Ceilings**
Perforated return grilles
- e. **Return Grilles – Hard Ceilings**
Louvered return grilles ducted to return mains.
- f. **Exhaust Grilles – Hard Ceilings**
Louvered return grilles ducted to exhaust mains.
- g. **Air distribution in areas without ceilings:**
Double wall round spiral sheet metal ductwork (paintable) with 2" duct wrap insulation - duct mounted double deflection type grilles

Exhaust Systems:

- a. Rectangular or round galvanized sheet metal ducted from restrooms, break rooms, janitor closets to roof mounted exhaust fans. Roof mounted fans to be down-blast type with roof curb, fan speed control, electrical disconnect, and backdraft dampers.

Temperature Controls:

- a. Central temperature controls system to control all HVAC systems outlined above, including all equipment interface panels, controllers, valves, dampers, thermostats, sensors, relays, transformers, etc., necessary for proper operation.

Building Electrical Systems:

- a. **Service and Power Distribution**

The building will be served by two 480/277-volt, 3 phase, 4 wire electrical services. The first will be used for loads throughout the building. It come into a 2000-amp main switchboard and be distributed from there to branch panelboards, step down transformers, and 120/208-volt branch panelboards throughout the facility. The service switchboard will have a LSIG main circuit breaker, and SPD, and will be where the grounding electrode conductor is derived per the NEC. Both main breakers are required to have GFI and adjustable instantaneous trip for arc flash reduction. Large loads such as rooftop HVAC equipment will be fed directly from the switchboard.

The second service will be 3000 amps and will serve the data room servers (via UPS systems) and HVAC exclusively. It will enter a service rated automatic transfer switch (with LSIG breakers on each feeder) which will feed a 3000-amp switchboard with SPD.

The facility will have a generator system consisting of two paralleled 1500 kW diesel generator sets. These will feed four transfer switches – one for life safety loads (NEC Art. 700, with surge protection and selective coordination), one for legally required loads (Art. 701), one for general owner optional loads (Art. 702), and the data room service transfer switch (Art 702). All life safety panels will have SPDs. Life safety system and legally required system breakers shall have a selective coordination study by the gear manufacturer.

b. Lighting

Lighting in areas with lay-in ceilings will be WSU's standard troffer, H.E. Williams LED DI. Areas without ceilings will be suspended LED strips or mid-bay lighting. Lighting controls will be as required by IECC and LEED standards in each space. Lighting power loads will be required to meet the lighting power density requirements of each of these standards.

Office, conference room, testing lab, cyber range, deep fake lab, and product development spaces will require a 50-foot-candle average lighting level on the work plane. Electrical, mechanical, utility, maintenance, shipping, and service corridors will require a 30-foot-candle average lighting level. Egress paths will be marked with exit signs and emergency egress lighting will be backed by the life safety branch of the generator system.

Exterior lighting will be WSU Innovation Campus standard pole mounted lighting and generator-backed building mounted lighting at entrances for emergency egress lighting. Lighting controls will comply with IEEC and LEED requirements, to include photocell and astronomic time clock controls.

c. Telecommunications and Audio / Video Systems

Power, raceway, and rough-in will be designed for phone, data, and audio/visual systems throughout the building. Phone and data systems will be

designed and installed by WSU Information Technology Services.
Audio/visual systems will be designed and installed by WSU Campus Media Services.

d. Security

Nearly all doors throughout the facility will have badge reader access.

e. Data Room

The data center will contain 200 data racks, with an assumed load of 5 kW per rack. It will use Starline busduct to feed the data rack, with bus plugs to feed each rack. The busducts will be fed from the data center switchboard through five 250 kW UPSs (four active, one redundant).

f. Testing Lab

The testing lab will require power connections to each piece of testing equipment. Known larger connections to testing equipment include:

Power Testing Bench - 5 kW and 18 kW

Harmonics Test - 5 kW

Electrostatic Discharge Test– 8 kW

The harmonics test, electrostatic discharge test, and conducted emissions test will each require a 3'x5' grounded copper planes on wood or elevated floors for test units to set on during testing for electrical isolation. The conducted emissions test also requires routing its branch circuit through an LISN to verify that the test is not back feeding to the service.

Camera systems will be installed throughout the testing area for recording and verification of tests.

g. Cyber Range

The cyber range will require UPS and generator power for workstations and displays in the team rooms, as well as the HVAC serving those rooms.

Several wall displays will be installed in each team room. Speakers will be required for communication between the team rooms.

h. Deep Fake Lab

The deep fake lab will require UPS and generator power for least 6 workstations, each with one regular screen, one Wacom screen for direct input, and a sound mixing table. A large display will be wall mounted for collaboration.

i. Product Development

The product development space will require flexible power, data, and A/V systems capable of rapid adaptation for high capacity workstations, hand tools at work benches, and wall mounted displays for collaboration.

j. General Spaces

Private offices will have receptacles on each wall and a double data outlet at the desk. Open offices will require systems furniture connections and general use receptacles throughout. Conference rooms will have floor boxes with power, data, and A/V connections under the conference room table, with conduits to behind wall mounted displays for A/V cabling.

PROJECT FUNDING

This project will be funded from a combination of 1) Wichita State restricted use funds (generated from industry revenues), 2) grant funds, 3) funds from the State of Kansas, and 4) local tax dollars.

PROJECT SCHEDULE

Completion of the facility as soon as possible is essential. Therefore, the project consultants must meet all target dates and deadlines agreed upon with the University and defined at the initiation of design services. A projected schedule is included within this document.

COST OF SERVICING BUILDING

The cost of servicing the building will be provided through Wichita State restricted use funds.

WSU Convergence Science 2 Facility
Wichita State University
Wichita, Kansas

3/25/2020

PRELIMINARY PROJECT BUDGET

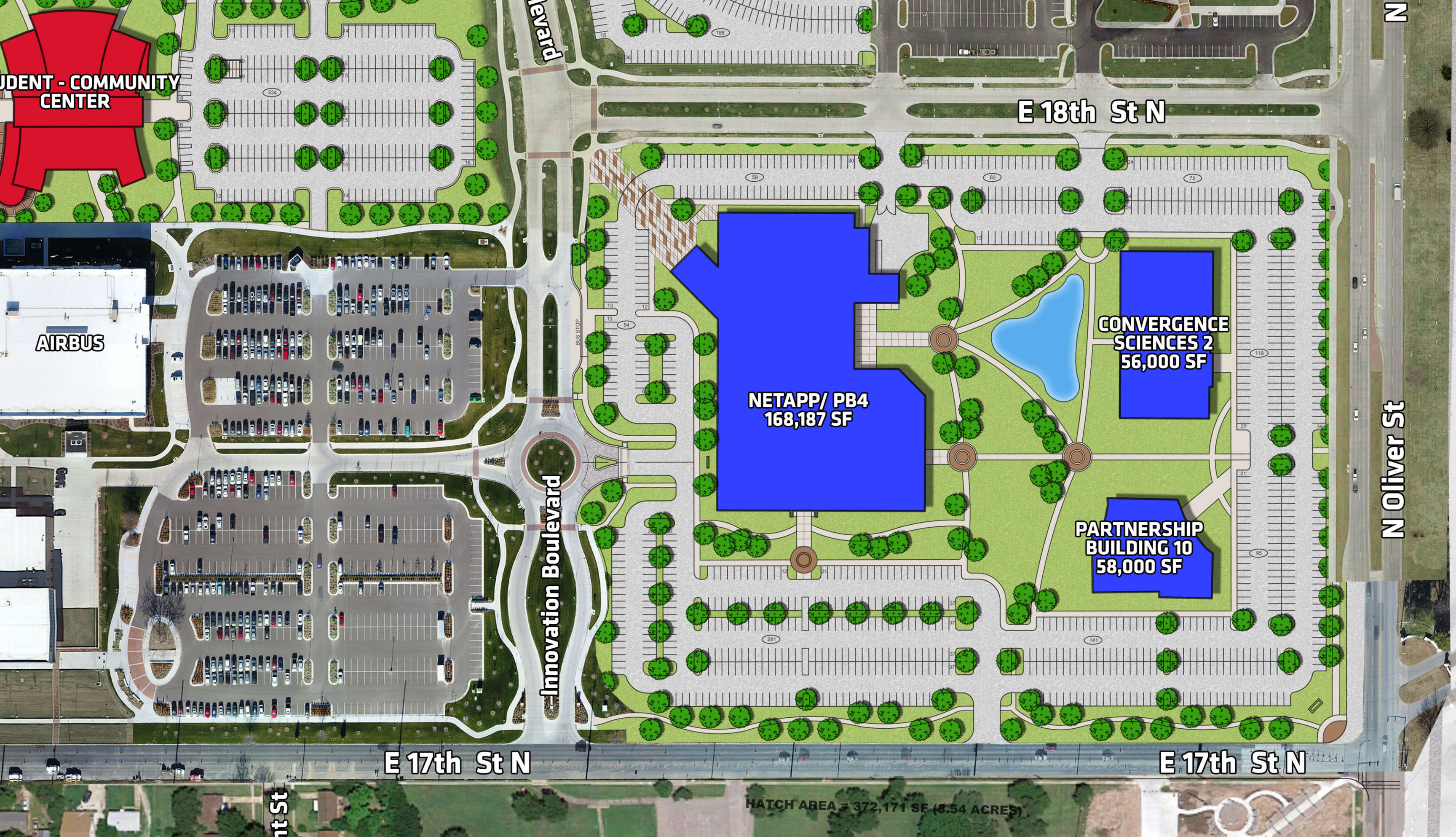
New Facility

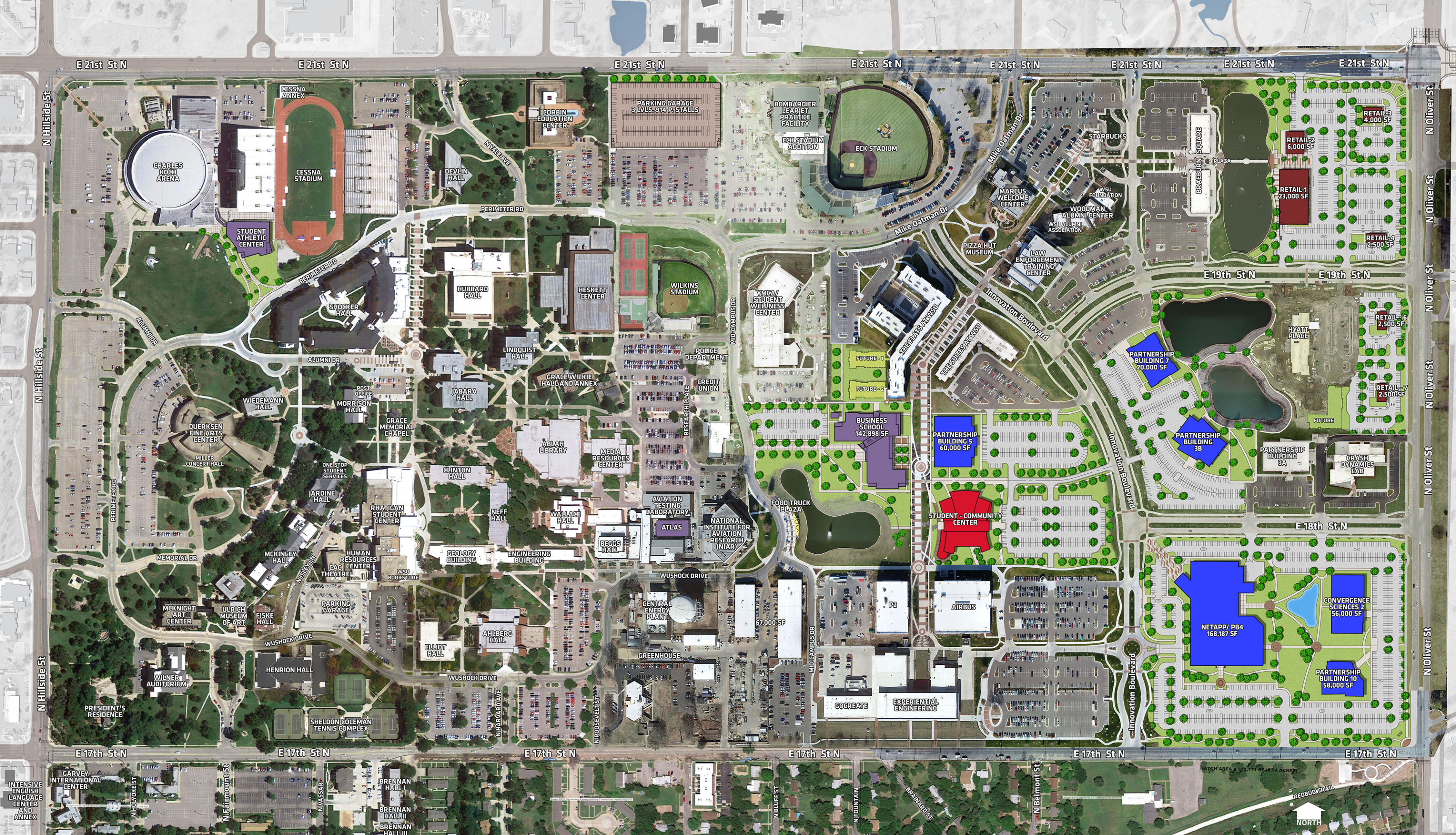
The preliminary cost estimate is based on the following assumptions and facts.

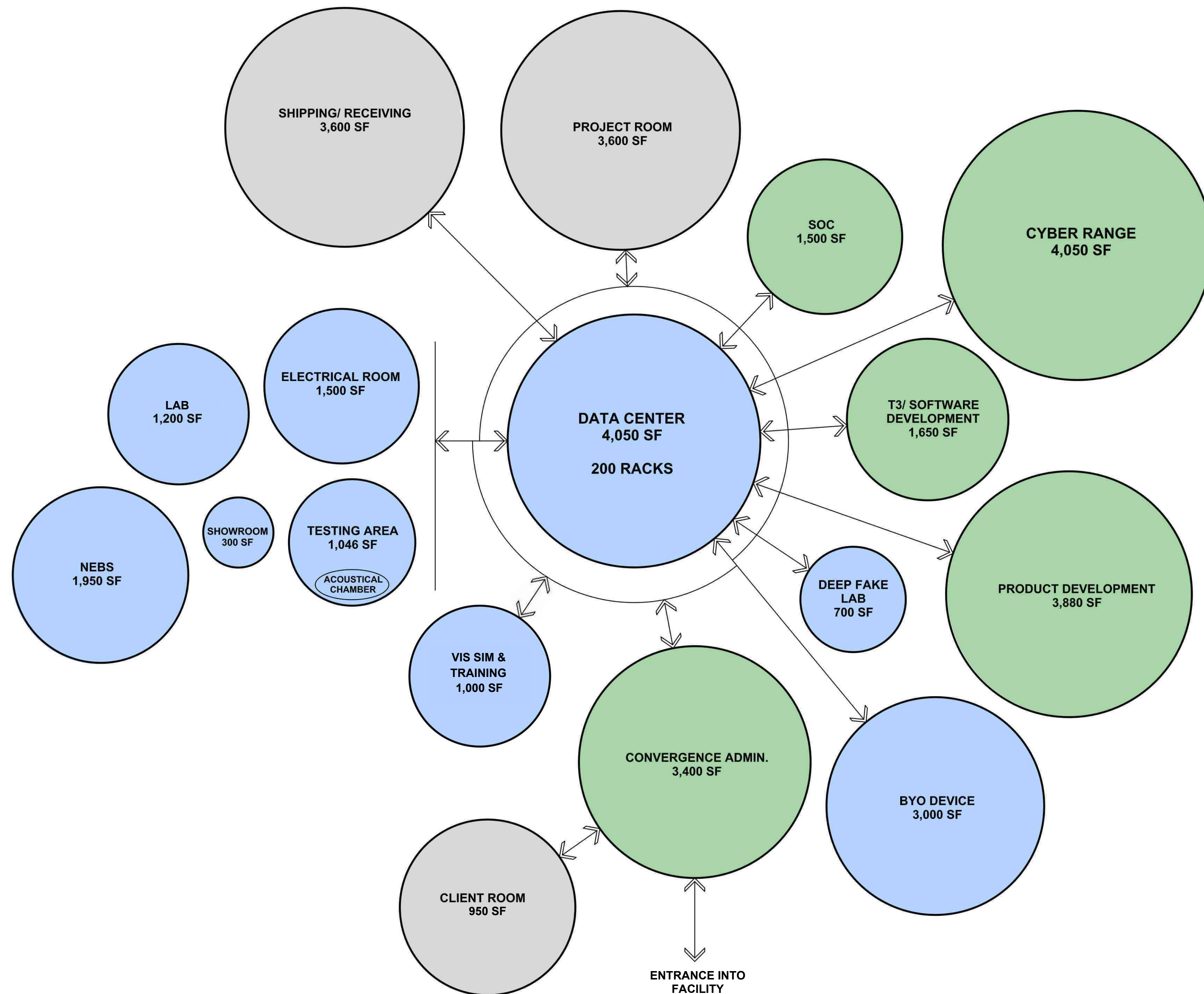
- * The costs are adjusted for the economic conditions of Wichita, Kansas
- * Budget is updated for 2020 Dollars

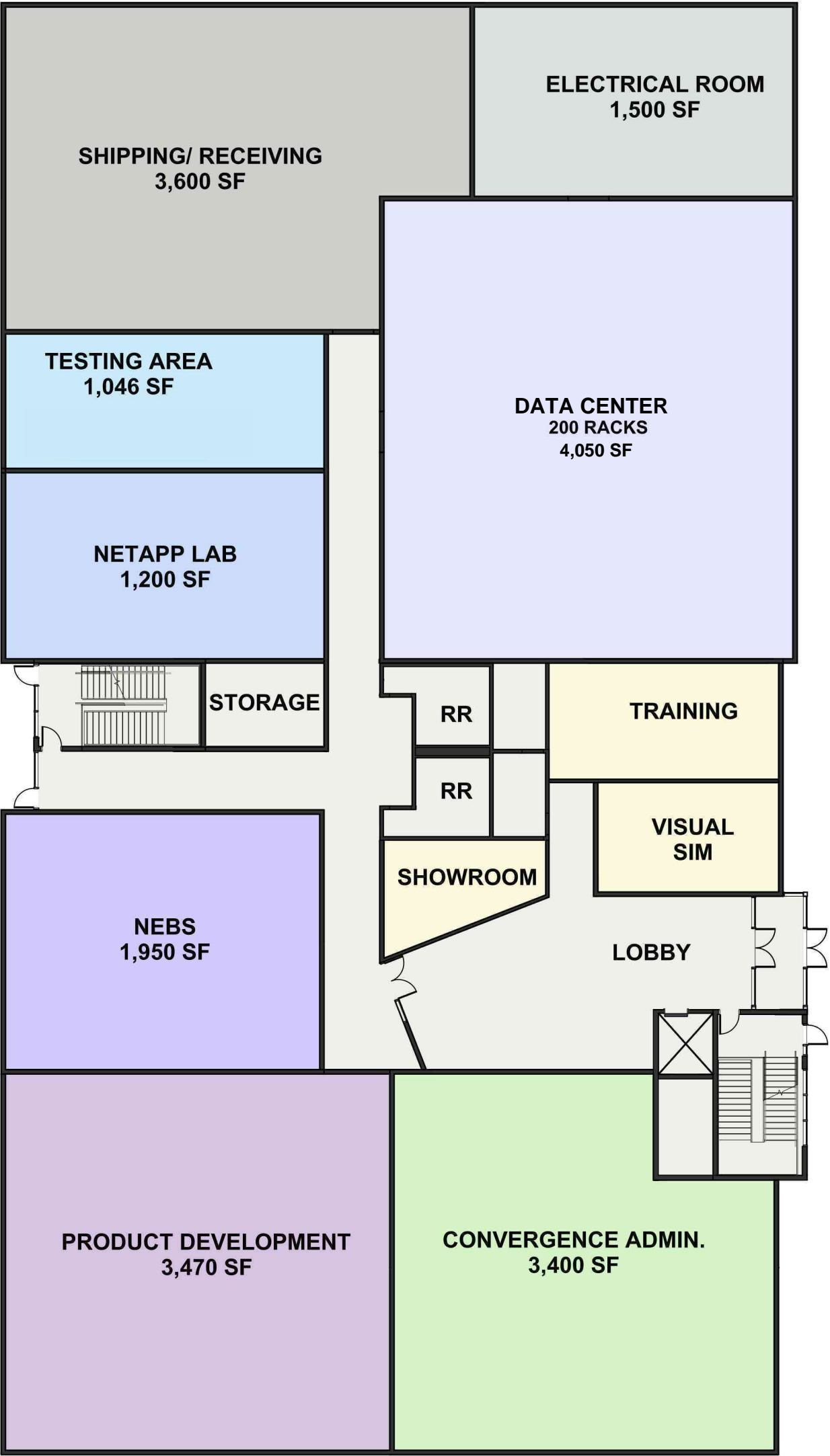
Item	Area	Cost/SF	Cost
A. Building Cost			
Programmed Space	49000	\$ 350	\$ 17,150,000
Shelled Space	7000	\$ 150	\$ 1,050,000
Subtotal Building Cost:			\$ 18,200,000
B. Total Construction		(includes site development costs)	\$ 18,200,000
C. Furniture Fixtures & Equipment (X% of Construction Cost)		2.5%	\$ 455,000
D. ITS Costs (Includes Door Security Costs)		Lump Sum	\$ 400,000
E. AV Costs		Lump Sum	\$ 275,000
F. Installation / Moving Costs		Lump Sum	\$ 75,000
G. Professional Fees (X% of Building Cost / Includes survey, Geotech, LEED Commissioning)		9.0%	\$ 1,638,000
H. LEED Registration and Review Fee		Lump Sum	\$ 6,000
I. Contingency (X% of Construction Cost)		6%	\$ 1,092,000
J. Estimated Plan Review and Permit Costs			\$ 84,000
K. Total Budget Required (B through J)			\$22,225,000

[illegible]





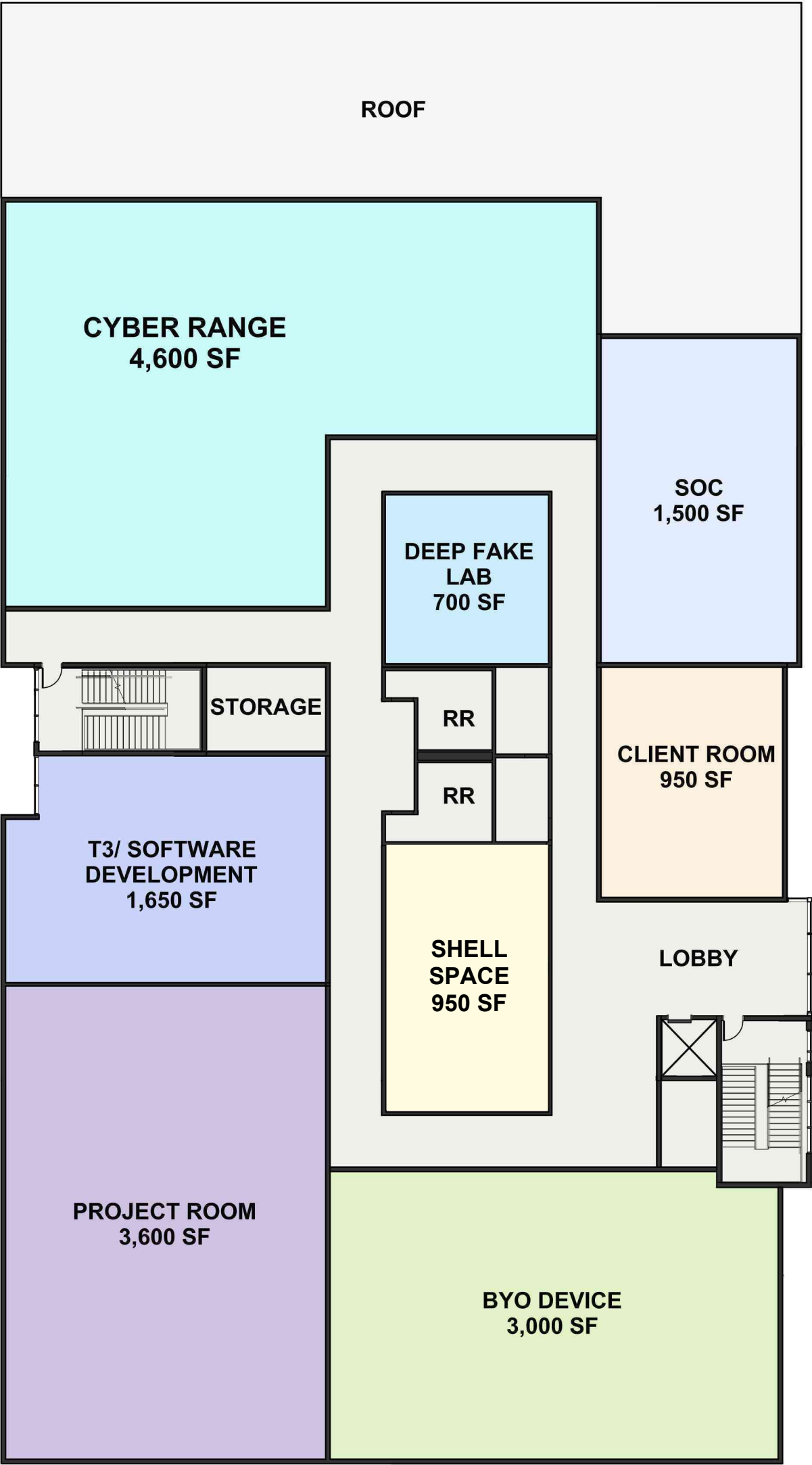




CONVERGENCE SCIENCE BLDG.
56,000 SF TOTAL

FIRST FLOOR
26,555 SF
SUPPORT SPACE
4,904 SF





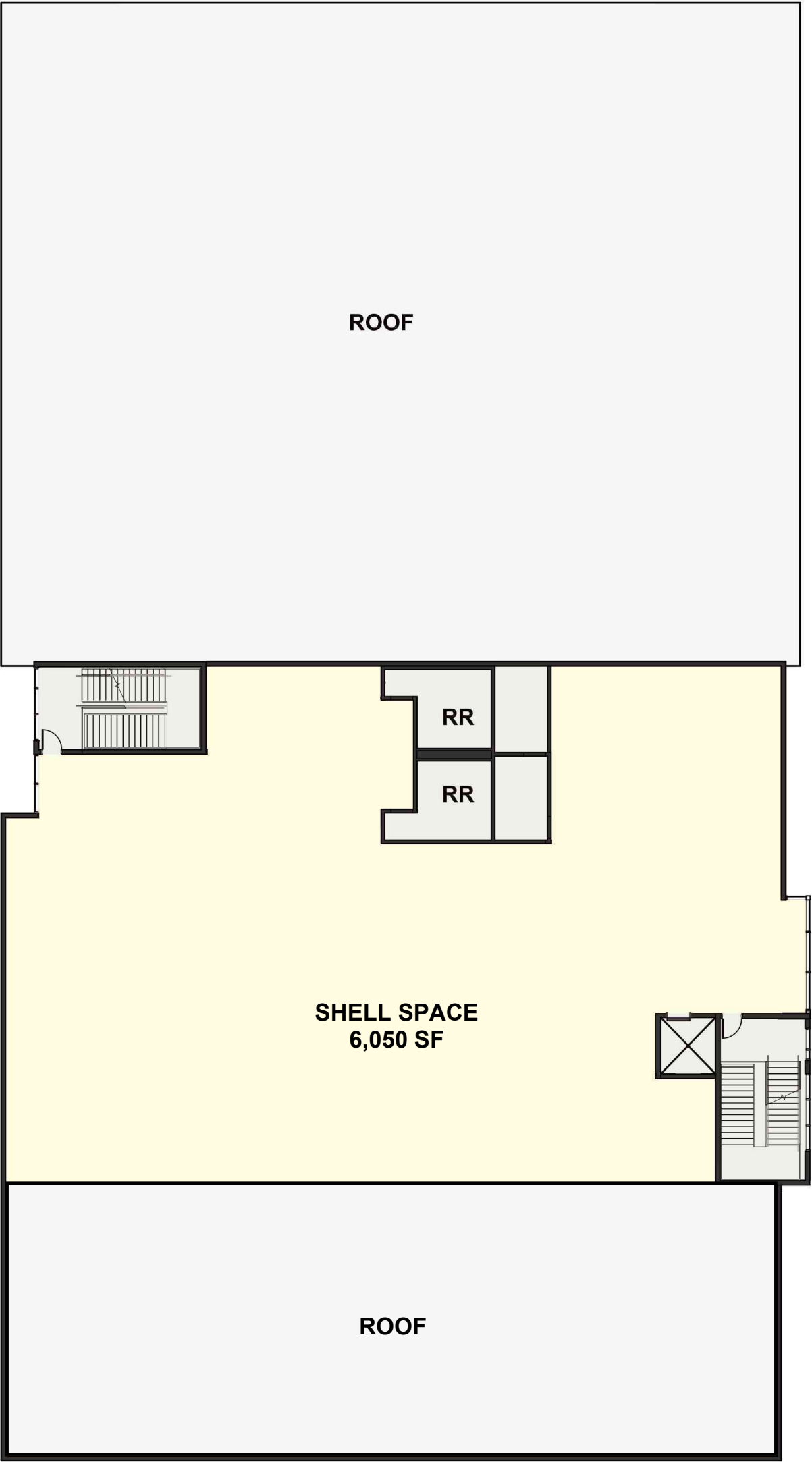
CONVERGENCE SCIENCE BLDG.
56,000 SF TOTAL



WICHITA STATE
UNIVERSITY

2ND FLOOR
21,533 SF
SUPPORT SPACE
4,583 SF





CONVERGENCE SCIENCE BLDG.
56,000 SF TOTAL

THIRD FLOOR
7,912 SF

